

JGSEE

NEWSLETTER

The Joint Graduate School of Energy and Environment

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From the Director



The last few months saw significant improvements in the strength of JGSEE's academic staff, with the addition of both visiting and full time members. We are particularly pleased to have **Dr. Larry Anderson**, a distinguished Professor in air pollution chemistry from the University of Colorado at

Denver, USA, to spend a 9-month sabbatical with us. We are also privileged to have the service of **Dr. Ing. Christoph Menke**, Professor of Energy and Environmental Engineering from the University of Applied Sciences, Trier, Germany, as a professor in energy technology and policy and industrial outreach advisor for at least two years. We also welcome younger generation lecturers like **Dr. Srisuda Dhamwichukorn** (Environmental Biotechnology) and **Dr. Suneerat Pipatmanomai** (Coal and biomass technology), as well as young Research Associate **Dr. Sebastien Bonnet** (Waste Management).

One of JGSEE's most active affiliated academic staff in thesis supervision, **Professor Dr. Somchai Wongwises**, was recently awarded **2004 Thailand Scientist of the Year** by the National Research Council of Thailand and also **Senior Research Fellowship** award by Thailand Research Fund. Congratulations Prof. Somchai! We look forward to his continued support and contribution to JGSEE.

We are pleased to note that **Assoc. Prof. Dr. Sirintornthep Towprayoon** and **Dr. Amnat**

Chidthaisong, both of JGSEE's Environment Division, have been recognized by the **Intergovernmental Panel on Climate Change (IPCC)** for their expertise in the areas of greenhouse gas inventory and carbon cycle processes, respectively.

A number of JGSEE's core and affiliated staff members are also to be congratulated for winning funding for various research and development projects.

Not to be outshone by the academic staff, JGSEE's students also won recognition in national and international arena, with **Ms. Kanitta Wongyai** being awarded the **Best Poster Presentation** at the 9th Conference of the Federation of European Chemical Societies; and **Dr. Benjaphon Suraraksa** winning the consolation prize for **Thailand Best Thesis of the Year**.

JGSEE's operation and performance was once again monitored and evaluated by the Technical Expert Group (TEG) appointed by the Commission on Higher Education. In their Annual Technical Review Report for 2003, the TEG opined "*.....Now JGSEE is in the implementation phase of its R&D roadmaps which were results of the strategic planning activities. JGSEE has remarkably turned itself into an organization whose working environment and administrative policy are driving toward being a center of excellence.....*"

However, JGSEE does have some weaknesses, one of which being the lack of industrial linkages, particularly with the private sector as pointed out by the TEG. I therefore would like to urge both our core and affiliated



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staff to make a conscious effort to boost our industrial outreach activities be they in joint research, contract research, training or consultancy.

Bundit Fungtammasan

Staff Strength Boosted at JGSEE

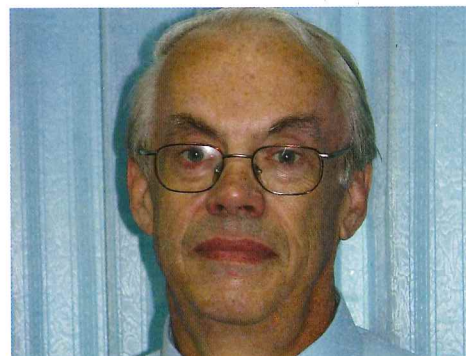
JGSEE welcomes among its rank of faculty Prof. Christoph Menke, who joined the Graduate School in August 2004 as a professor and advisor to the Industrial Outreach Program with partial sponsorship of the German Government supported Centre for International Migration (CIM) Program. Dr. Menke has a Dr.-Ing. in the field of mechanical engineering from the Technical University of Braunschweig, Germany. His previous degrees are in mechanical engineering (Dipl.-Ing.) from the Technical University of Braunschweig and in Energy Management from the Technical University of Berlin, Germany. He brings with him a wide range of experience.



Prof. Christoph Menke

For more than seven years Christoph Menke has been a Professor in Energy and Environmental Engineering at the University of Applied Sciences in Trier, Germany. Besides lecturing various technology and policy subjects, Prof. Menke has been advising the German Agency for Technical Cooperation (GTZ) and other international organisations like UNDP on issues of project

planning and project evaluation for energy and environmental projects, especially with a focus on renewable energies and energy efficiency. Prior to that position he worked in the field of Technical Cooperation in various countries in the position of senior energy advisor, energy specialist and as project manager for more than 10 years. He specialises in consulting on energy and environmental sector strategy issues and on energy and environmental technologies. He combines a strong academic background with practical experience of working in Developing Banks (World Bank, Washington and CDB, Barbados), with Energy Ministries (Ministry of Mining and Energy, Jamaica), with consulting companies (EnergySystemsNorth, Kiel, Germany) and in several technical cooperation projects for GTZ. Prof. Menke's main area of focus is on renewable energies and energy efficiency issues and conventional energy technologies. His current interest is to support JGSEE in establishing an Industrial Outreach Program as a service facilitator to industry, to strengthening the international network of the JGSEE and to assist various JGSEE projects in the field of energy and environment, particularly those related to technology and policy issues, and to contribute to lectures in energy management and energy & environmental policy.



Prof. Larry G. Anderson

JGSEE also welcomes **Prof. Larry G. Anderson** as a visiting professor. Dr. Anderson is a full time professor at the University of Colorado at Denver. He has a PhD in Physical Chemistry from Indiana University. Prof.

Anderson has over 30 years experience with air quality related work. This includes 1 year at the National Center for Atmospheric Research in Boulder, Colorado and 9 years as Atmospheric Chemistry group leader at General Motors Research Laboratories, prior to joining the faculty at the University of Colorado at Denver. His work ranges from fundamental studies of the kinetics of atom-molecule and radical-molecule reactions that occur in the atmosphere to the measurement and analysis of a number of different pollutants in the ambient air. He has also worked on a number of indoor air quality studies and studies related to the cleaning of indoor air. He has spent about 15 years working on evaluating the effects of using ethanol-blended fuels on urban air quality. Much of this work involved evaluating the effects of using these fuels in the US. He has considerable experience in the design and conduct of air quality studies, and in the analysis and interpretation of the data from these studies.

Since arriving in Thailand, Prof. Anderson has had the opportunity to spend a few days visiting Chiang Mai University (CMU) and Prince of Songkhla University (PSU). At CMU, he had extensive discussions with faculty mostly in Environmental Engineering and Chemistry. These discussions were largely related to air quality issues in Chiang Mai, and future studies to be conducted in Chiang Mai. While at PSU, much of the discussion was with faculty in Mechanical Engineering, related to biodiesel fuel and its use.

Prof. Anderson plans to be in Thailand through March 2005. While in Thailand, he will get a much better understanding of the air quality situation in Thailand. Hopefully, this information can be useful in the design and planning of future air quality projects in Thailand. Problems of particular interest to Prof. Anderson include ozone concentration and exposure in Thailand, the contribution of diesel emissions, biomass burning and other sources to the particulate matter in the air in Thailand, and changes in emissions of motor vehicles

related to changes in fuels used in these vehicles. He expects to work on data analysis and interpretation related to these and other air quality issues in Thailand. Prof Anderson will be teaching a series of short courses in the area of air pollution chemistry, including Background for Air Pollution Chemistry; Ozone, Gaseous and Hazardous Air Pollutants; Acid Deposition and Particulate Matter; and Air Pollution Modeling and Control.

JGSEE also welcomes **Dr. Sebastien Bonnet, Dr. Suneerat Pipatmanomai, and Dr. Srisuda Dhamwichukorn.** Dr. Sebastien Bonnet joined the Environment Division in June 2004 as a Research Associate. He holds an MPhil/PhD degree in the field of waste management from the Lincoln University in England. His previous degree is in the field of Environmental and Biological Science from the University of Bordeaux I and ISNAB, France. Prior to his employment at JGSEE, Dr. Sebastien worked in England as an analyst in the R&D Department of Allied Laboratory Ltd, and as a part-time Lecturer and Research Assistant at the Lincoln University. His current field of interest is waste management though he has also started to work on atmospheric pollution related topics.



Dr. Sebastien Bonnet

Dr. Suneerat Pipatmanomai has a BSc in Chemical Technology from Chulalongkorn University. Subsequently, she received an MSc and PhD in Chemical

Engineering at Imperial College London, UK. Her PhD research was a combination of experimental and modelling work to investigate the pyrolysis and combustion behaviour of coal, simulating injection into the blast furnace raceway. Dr. Suneerat was awarded a PhD Studentship from Imperial College under an European Coal and Steel Community (ECSC) contract, and also awarded the RH Gummer Exhibition Prize of Institute of Energy in 2002 for excellent final year project. Before joining JGSEE, Dr. Suneerat worked as a lecturer at the Chemistry Program, Bansomdej Chaopraya Rachapat University. At JGSEE, she is an instructor for the Coal Technology course and carrying out research in several themes. On-going and proposed research projects include: Combustion of spent activated carbon (S contained) with dolomite for recovery of heat and gypsum products, study of fast pyrolysis of Thai agricultural wastes, and mathematical modelling of biomass gasification.



Dr. Suneerat Pipatmanomai

Dr. Srisuda Dhamwichukorn, an Environmental Biotechnologist, received her PhD from Michigan Technological University, USA, and her MSc in Biotechnology and BSc in Botany from Chulalongkorn University. Upon completing her PhD in 2001, she took up a postdoctoral position at the Center for Environmental Science and Technology and the Department of Biological Sciences of the University of Notre Dame, Indiana, USA. She has been involved in using and developing cutting edge, postgenomic technologies such as bioinformatics

and microarrays for her research of environmental improvement and cleaner energy production. Her research interests are biomass and energy production from wastes including biohydrogen, environmental pollution control, microbial characterisation, genomics, and nanobiotechnology applications.



Dr. Srisuda Dhamwichukorn

Congratulations to Dr. Srisuda on her recent invitation by the International Society of Food, Agriculture and Environment (ISFAE) to be the **Vice Chair of "Environmental Biotechnology: Waste Treatment and Resource Recovery"**, a subsection of the Journal of Food, Agriculture and Environment (JFAE). The JFAE publishes peer-reviewed, original research, critical reviews or short communications in food science & technology, human nutrition, animal science, agriculture and environment, with particular emphasis on interdisciplinary studies on the food, agricultural, and environmental interfaces. Dr Srisuda has been invited to be on the board representing South-East Asia.

Prof. Somchai Awarded Thailand Scientist of the Year

JGSEE would like to congratulate Prof. Dr. Somchai Wongwises, one of JGSEE's affiliated staff, on being awarded the 2004 Thailand Scientist of the Year in the

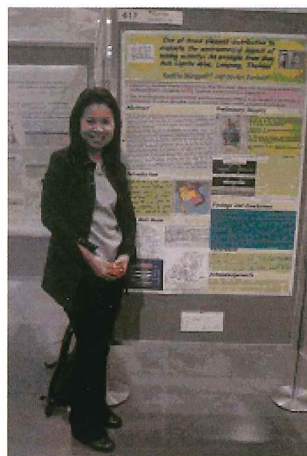
field of engineering and industrial research. This award is presented every year by the National Research Council of Thailand. He is currently working at the Department of Mechanical Engineering, King Mongkut's University of Technology Thonburi (KMUTT). His research interests are the study of two-phase flow, and heat and mass transfer, particularly on the design of refrigeration system components based on alternative, non-CFC refrigerants. He has helped supervise a number of JGSEE's Masters and PhD students over the past years.



Prof. Dr. Somchai Wongwises

JGSEE Students Wins International and National Recognitions

Congratulations to **Ms. Kanitta Wongyai**, who won the Division of Chemistry and Environment, Federation of European Chemical Societies, French Chemical Society (DCE/FECS/SFC) Award for the Best Poster Presentation (with the paper entitled "Use of trace element to evaluate the impact of mining activity: An example from Mae Moh lignite mine, Lampang, Thailand") at the 9th Conference of the Federation of European Chemical Societies (9th FECS), 29 August - 1st December 2004, Bordeaux, France. Kanitha is a PhD candidate in Environment Division. Her thesis is supervised by Asst. Prof. Dr. Savitri Garivait.



Ms. Kanitta Wongyai

JGSEE would also like to praise **Dr. Benjaphon Suraraksa**, a former PhD student in Environment Division, on being awarded the consolation prize for **2004 Thailand Best Thesis of the Year**. This award is presented by the National Research Council of Thailand. Her thesis entitled "Initial Biofilm Development during Start up Period of Anaerobic Hybrid Reactor" was supervised by Prof. Dr. Morakot Tanticharoen, Director of the National Genetic Engineering and Biotechnology Center (BIOTEC), and Asst. Prof. Dr. Pawinee Chaiprasert of the School of Bioresources and Technology, KMUTT.

JGSEE Staff Earns International Recognition on Climate Change

Two members of the JGSEE's Environment Division have been invited as lead authors on different Intergovernmental Panel on Climate Change (IPCC) publications. **Assoc. Prof. Dr. Sirintornthep Towprayoon**, Chair of the Environment Division, has been selected to participate as a Lead Author in the Waste sector for the revision of the IPCC Guidelines for National Greenhouse Gas Inventories (IPCC Guidelines). In this capacity, she will be responsible for the production of designated sections of the guidelines addressing items of the work program on the basis of the best scientific, technical and socio-economic information available. **Dr. Amnat**

Chidthaisong has been invited by the IPCC Working Group I Bureau to act as a Lead Author for Chapter 7: "Couplings between Changes in the Climate System and Biogeochemistry" of the Working Group I contribution to the Fourth Assessment Report. In this capacity, he will be responsible for assembling material solicited from scientific community and writing parts of Chapter 7. This chapter deals with assessment of carbon cycle processes, controls, budgets, sources, sinks; evaluating progress in simulating/understanding inter-annual variability; considering the effect of carbon coupling on future; inversion analysis and implications for source/sink distributions.

JGSEE Awarded Grants for National and International Projects

An Integrated Research Roadmap for Sustainable Metropolis: Energy and Environment (SM E&E)

JGSEE, with the collaboration of the School of Energy and Materials and School of Architecture and Design, KMUTT, recently won the support of the National Research Council of Thailand (NRCT) to develop an integrated research roadmap for sustainable metropolis, with an emphasis on energy and environment. The aim of this project is to develop an integrated R&D roadmap in energy and environment that would serve to direct R&D efforts in support of sustainable development for Bangkok Metropolis with respect to the society, the economy, and the environment. This roadmap is meant to be used by the relevant agencies as a guideline for funding and undertaking R&D projects related to technology development and technology management.

The Study on Values and Impacts of Distributed Generation in Thailand

The study on values and impacts of distributed

generation (DG) in Thailand, financially supported by the Knowledge Network Institute of Thailand (KNIT), is focused on the installed distributed generators in four aspects; technical requirements, value and adverse effects, social impacts, and environmental impacts. Technologies selected as case studies were photovoltaic cell, small hydro-turbine, wind energy, and energy from biomass. The research team, led by **Dr. Athikom Bangviwat** of JGSEE, Included **Asst. Prof. Dr. Chumnong Sorapipatana** from JGSEE, **Assoc. Prof. Dr. Worawit Tayati** from Electrical Engineering Department, Chiang Mai University, **Assoc. Prof. Dr. Bundhit Eua-arporn** from Electrical Engineering Department, Chulalongkorn University, and **Dr. Shabbir H. Gheewala** from JGSEE. The study revealed barriers to the establishment of the small power generation and provided policy recommendations for the promotion of the distributed generation in the country.

Estimation of Pollutant Emissions from Biomass Burning in Mekong River Basin Sub-Region (Thailand, Cambodia, Laos and Vietnam)

This project, coordinated by Asst. Prof. Dr. Savitri Garivait, is funded by Southeast Asia Regional Committee for START (SARCS). A global System for Analysis, Research and Training (START) is an international, non-governmental organization co-sponsored by the Earth System Science Partnership (ESSP) comprising international global change research programmes, International Geosphere-Biosphere Programme (IGBP), International Human Dimensions of Global Environmental Change Programme (IHDP) and World Climate Research Programme (WCRP). This project will be part of the Biogenic and Anthropogenic Emissions from Southeast Asia Project initiated by SARCS (The Southeast Asia Regional Committee for START). The aim of this project is to

develop biomass burning emission data from Southeast Asia region using local data focused on the Mekong River Basin Sub-Region (Thailand, Cambodia, Laos and Vietnam). The duration of this project is 17 months starting from 1 May 2004 to 30 September 2005.

Strategic Planning of an Integrated Solid Waste Management System of a Medium-Scale Municipality in Thailand

In this research, it is proposed to develop a decision-making support system for solid waste management of a medium-scale municipality taking into account: (1) environmental assessment based on LCA, (2) gender equality considering the current situation as baseline and (3) quality of life through public awareness and participation as well as social equity. The project is of one year duration and Hua Hin has been selected as the study site. The project is part of the Joint Action Research Program of the Southeast Asia Urban Environmental Management Applications (SEA-UEMA) Project at the Asian Institute of Technology, funded by the Canadian International Development Agency (CIDA). The principal investigator of the project is Dr. Shabbir H. Gheewala, lecturer at JGSEE. He is supported by Assoc. Prof. Dr. Sirintornthep Towprayoon, Asst. Prof. Dr. Savitri Garivait and Dr. Sebastien Bonnet.

Research Career Development Grants

Three of JGSEE's young academic staff have been awarded "new researcher" or "research career development" grant by the Thailand Research Fund (TRF). These projects involve the study of biomass carbonization in hot compressed water by Dr. Nakorn Worasuwanarak, the design of hydrogen production unit based on the feedstock available from Thailand for application in Solid Oxide Fuel Cells by Dr. Navadol Laosiripojana, and the study of combustion with dolomite for activated carbon

based catalyst collected from the H_2S removal process at Rayong's gas separation plant by Dr. Suneerat Pipatmanomai.

PTT Hydrogen Production Project



Dr. Navadol Laosiripojana has received a research grant from PTT Public Company for 2 years, starting 1 January 2004, to investigate the possible use of natural gas for application in fuel cells.

The main focus of this project is to determine a suitable process for the production of hydrogen with Thai natural gas as feedstock. Hydrogen, which is the main fuel for energy conversion using fuel cells, can be generated by reforming several hydrocarbon sources. Currently, natural gas seems to be the major resource for hydrogen production due to its abundance and economic viability. Both technical and economic feasibility will be evaluated. The technical issues will include the suitable type of reforming catalysts, reformer configuration, and its operating conditions. A lab scale reformer unit for hydrogen production from natural gas has been constructed. Gas purification and pre-reforming units will also be built. For the economic issues, the investment cost for construction and installation of an industrial scale plant will be estimated. Finally, the suitability of this technology for Thailand will be assessed.

JGSEE-Kyoto Joint International Conference



JGSEE and Kyoto University are to organize a Joint International Conference on Sustainable Energy and Environment (SEE) during 1 - 3 December 2004 at Hilton Hua Hin Resort & Spa, Hua Hin. This Conference incorporates the 3rd Regional Conference on Energy Technology towards a Cleaner Environment (3rd RCETCE) organized by JGSEE and the 21 COE Symposium on Sustainable Energy System organized by Kyoto University. Over 250 participants from various countries are expected to attend the Conference and more than 200 papers will be

presented. Ten topics in the area of renewable energy, energy efficiency, cleaner production technologies, air pollution, energy and environmental policies will be covered.

During this conference several keynote lectures will be given by experts including the Honorable Minister of Energy of Thailand. Many more events will also be organized as part of this Conference, including a Pre-conference seminar on Clean Coal Technology, exhibitions, poster award and a technical tour. This International Conference will therefore provide a great opportunity to all of those who are involved in dealing with issues related to energy and environment to meet, share experiences and potentially develop collaborations. JGSEE and Kyoto University are looking forward to welcoming our readers, at Hua Hin, for this important international event.

JGSEE is an educational and research consortium involving King Mongkut's University of Technology Thonburi, King Mongkut's Institute of Technology North Bangkok, Chiang Mai University, Prince of Songkhla University and Sirinthorn International Institute of Technology - Thammasat University. It is funded by the Thai Government under ADB Loan Program on Higher Education Development with complementary support from the Energy Policy and Planning Office, Ministry of Energy.

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